

**Recovery Outline for
Trispot Darter (*Etheostoma trisella*)
December 2018**

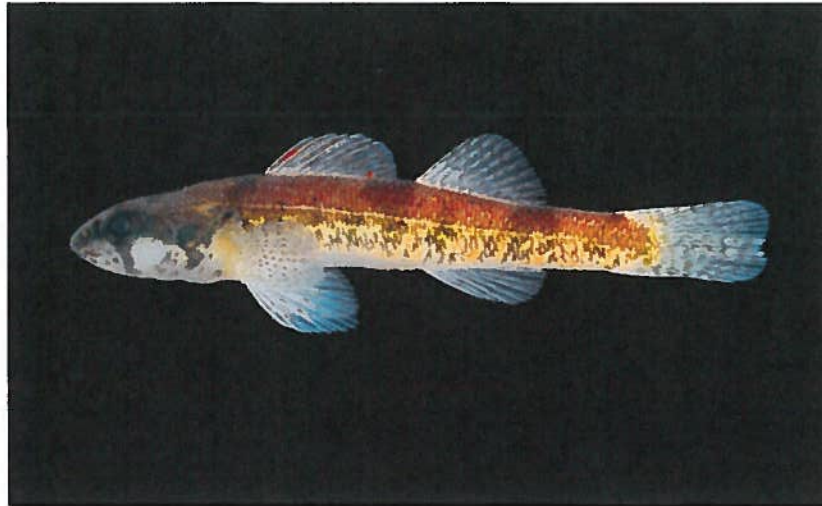


Photo courtesy of Pat O'Neil, Geological Survey of Alabama

I. INTRODUCTION

This document outlines a preliminary course of action for the recovery of the trispot darter until a comprehensive recovery plan for the species is approved. The trispot darter was listed as a threatened species on December 28, 2018 (83 FR 67131). This freshwater species is a small-bodied, benthic fish native to the Coosa River system in Alabama, Georgia, and Tennessee. The analysis of past, current, and future influences on what the trispot darter needs for long-term viability revealed habitat degradation and hydrologic alteration as principal factors affecting future viability of the species. Specifically, incompatible land-use practices and the associated impacts to habitat connectivity, water quantity, water quality, and linear distribution of occupied habitat influence the trispot darter's viability.

Listing and Contact Information:

Listing Classification:	Threatened range-wide
Effective Listing Date:	January 28, 2019
Lead Agency, Region:	U.S. Fish & Wildlife Service, Southeast Region
Lead Field Office:	Alabama Ecological Services Field Office
Contact Biologist:	Jennifer Grunewald, 251-441-6633, jennifer_grunewald@fws.gov

II. RECOVERY STATUS ASSESSMENT

A. BIOLOGY/THREATS ASSESSMENT

The trispot darter is a migratory species that utilizes distinct breeding and nonbreeding habitats. Predominate food items have been found to be non-biting midge larvae and pupae and mayfly nymphs (Ryon 1986). Between April and October, the trispot darter inhabits its non-breeding

habitat located on the margins of small to medium sized rivers in areas of slower velocities. The species has also been documented in larger rivers such as the Coosa River. Within these areas, additional needs and requirements include detritus, woody debris, and stands of water willow (*Justicia americana*) over stream substrate consisting of small cobble, pebbles, gravel, and fine layers of silt. In late fall, the trispot darter begins to move toward spawning areas, identified as ephemeral streams that hold water from November through April. Migration into spawning areas begins in late November/early December and is likely stimulated by precipitation, temperature, and changes in daylight hours. Individuals remain in the spawning areas until late April. Adult males and females range in size from 1.3 to 1.6 inches (in) (33 - 40 millimeters (mm)) standard length (Mettee *et al.* 1996), and the body is slender to moderately stout (see photo above). The darter has three prominent black dorsal saddles, pale undersurface, and a dark bar below the eye (Bailey and Richards 1963). Scattered dark blotches exist on the fin rays. This fish lives a maximum of three years but most likely dies after the end of their second year (Ryon 1981). During breeding season, males are a reddish-orange color and have green marks along their sides and a red band through their spiny dorsal fin.

All known records of the trispot darter occur above the fall line in the Ridge and Valley ecoregion of Alabama, Georgia, and Tennessee. Historically, this species occurred throughout the middle to upper Coosa River Basin with records from the mainstem Coosa, Conasauga, and Coosawattee rivers, their tributaries, and tributaries to the Oostanaula River all within the Ridge and Valley ecoregion. Genetic studies on the species indicate that this species historically maintained gene flow throughout the upper Coosa River Basin and ranged from at least the Little Canoe Creek system near Springville, Alabama to the Upper Conasauga River, near Conasauga, Tennessee. However, due to several large impoundments, populations are now fragmented and only occur in Little Canoe Creek and its tributaries, Ballplay Creek tributaries, Conasauga River and its tributaries, and Coosawattee River and a single tributary.

Based on the recently conducted Species Status Assessment (SSA), the long-term viability of the trispot darter is affected by habitat degradation and hydrologic alteration. Specifically, incompatible land-use practices and the associated impacts to habitat connectivity, water quantity, water quality, and linear distribution of occupied habitat influence the darter's viability (Service 2018).

Reduced Connectivity - Numerous natural features, such as beaver dams and waterfalls, as well as manmade structures, can limit or prevent fish movement. Structures installed at road crossings (bridges and culverts), dams, and pipelines all have the potential to act as barriers to fish movement, reduce exchange of genetic material between populations, increase a population's vulnerability to local extinction, and prevent recolonization after extirpation has occurred.

Hydrologic Alteration - Hydrologic alteration (changes in the water flow) can cause: 1) increases in storm flow frequency and intensity, and 2) a decrease in base flows. Activities that lead to hydrologic alteration include reservoir construction and operation, surface water and groundwater withdrawals, and urbanization. Non-hydropeaking reservoirs, farm ponds, amenity lakes, and other impoundments may substantially alter flows by storing water during low flow periods, effectively dampening moderate to high flows and in some cases augmenting flows. Reduced base flows decrease the habitat available to darters.

Channel Modification - Channel modification resulting in habitat alteration can be caused by activities such as: channelization, piping, in-stream construction (e.g. bridges, culverts, and others), in-stream mining, and reservoir creation. Channel modification can lead to a loss of essential trispot habitat components, or completely destroy habitat. Alterations to the stream channel and adjacent land may occur through land conversion, causing decline in available spawning habitat for the trispot darter.

Urbanization - Urbanization refers to a change in land cover and land use from forests or agriculture to increased density of residential and commercial infrastructure. Urbanization is expected to affect the trispot darter across its range due to the majority of known localities occurring in close vicinity to the growing metropolitan areas of Atlanta, Chattanooga, Birmingham, and additional intervening areas with growing populations and increasing development.

Loss of Riparian Vegetation (plants along river margins and stream banks) - Removal of riparian vegetation can destabilize stream banks and cause increases in stream sedimentation, turbidity, water temperature, and the amount of light that hits the water. There are numerous pastures where livestock have access to streams which have been identified as spawning habitat for the trispot darter in the Little Canoe Creek watershed. Livestock accessing riparian buffers and, subsequently, the stream proper, lends to increased concern for future water quality issues and habitat destruction. Livestock accessing streams also destabilize stream banks which creates increased sediment loads within these small systems.

Sedimentation - A wide range of activities can lead to sedimentation within streams that can include: agriculture, construction activities, stormwater runoff, unpaved roads, forestry activities, utility crossings, dredging, and historic land use.

Water Quality and Nonpoint Source Pollution

Contaminants - Contaminants, including metals, hydrocarbons, pesticides and other potentially harmful organic and inorganic compounds, are common in urban streams and may be partially responsible for the absence of sensitive fish in those systems. Sources may include wastewater treatment plants, mines, and industrial facilities. Non-point sources are more difficult to pinpoint. Pesticides are frequently found in streams draining agricultural lands, with herbicides being the most commonly detected.

Poultry Litter - Poultry litter is a mixture of chicken manure, feathers, spilled food, and bedding material that frequently is used to fertilize pastureland or row crops. Surface-spreading of litter allows runoff from heavy rains to carry nutrients and estrogens, a type of endocrine disruptor that can be found in poultry litter, from manure into nearby streams. Estrogens have been found in water and sediment samples within the Conasauga River watershed at concentrations high enough to be disruptive to the endocrine system in fish.

Weather Events - Weather events that affect stream flows are considered to be most relevant to the species. Broadly, these events include extreme storms and droughts. Increased flows can cause physical washout of eggs and larval fishes, stress on adults, and alter the production in a stream. Within the range of the trispot darter, extreme flows associated with hurricanes have been reported to have negative effects on stream fish populations. On the other hand, reduced baseflows due to droughts can also cause population declines, habitat loss, reduced water quality

(decreased dissolved oxygen and temperature alteration) leading to death, crowding of individuals leading to stress, and decreased reproduction in stream fish populations.

A multitude of natural and anthropogenic factors may impact the status of species within aquatic systems. The largest threats to the future viability of the trispot darter involves habitat degradation from stressors influencing four habitat elements: water quality, water quantity, instream habitat, and habitat connectivity. All of these factors are exacerbated by the effects of weather events.

B. CONSERVATION ACTIONS

The trispot darter is recognized by Alabama, Georgia, and Tennessee as a species of concern. This species is listed as Priority 2/High Conservation Concern by the state of Alabama (Wood 2016), endangered by the state of Georgia (GADNR 2015), and threatened by the state of Tennessee (Tennessee Wildlife Resource Agency 2015). Priority watersheds within the range of the trispot darter have been designated as Strategic Habitat Units (SHUs) by the Alabama Rivers and Streams Network (ARSN) (Wynn *et al.* 2012). The SHU project was developed for species restoration and enhancement. A threats analysis is being conducted through collaborative efforts among federal, non-federal, not-for-profit organizations, and academia and the results will contribute to restoration projects that will improve habitat and water quality for at risk and listed species. Road crossing assessments, dam removals, and stream bank stabilization project have been and/or are planned in the species' range. State agencies collect fish community data that has informed the status of the trispot darter and we expect to continue and grow our partnerships with Alabama, Georgia, and Tennessee in surveying and monitoring to better understand this fish's range and life history. The Atlantic Coast Conservancy holds a tract of land within the Ballplay Creek system which will preserve the land and offer protection in the watershed. Natural Resource Conservation Service's (NRCS) Working Lands for Wildlife (WLFW) partnership within the Coosa River Basin will help farmers develop and implement strategies to improve water quality.

III. PRELIMINARY RECOVERY STRATEGY

A. RECOVERY PRIORITY NUMBER WITH RATIONALE

The trispot darter is assigned a recovery priority of 8C, which indicates the species faces a moderate degree of threat and has a high recovery potential, including potential conflict with construction or other development projects or other forms of economic activity. The degree of threat is considered moderate because the species is not facing immediate extinction; however, the threats to trispot darter and its habitat are numerous and ongoing, thus contributing to a continual decline. The decline of the trispot darter is primarily due to habitat degradation resulting in reduced connectivity – among occupied watersheds and between the non-breeding habitat and the breeding habitat during spawning season. Recovery potential is considered high because several biological and ecological limiting factors are known; threats to the habitat have been identified and can be managed or avoided; and identified high quality habitats can be targeted for protection to enable recovery of the species. The conflict with construction or other development projects is relevant because the range of the species is within the rapidly urbanizing Birmingham-Atlanta region and the majority of occupied watersheds are influenced by reservoir development and hydropower.

B. RECOVERY STRATEGY/INITIAL ACTION PLAN

The ultimate goal of the recovery effort is to ensure the long-term survival of the trispot darter by controlling or reducing threats to the extent that populations are self-sustaining and protections afforded by the Endangered Species Act are no longer required. The initial plan is to work with partners, landowners, and stakeholders to reduce and alleviate threats to the trispot darter. We plan to work cooperatively with County, State (AL/GA/TN), Federal agencies, and private landowners to protect existing habitat integrity and quality that currently support or could support the darter. Specifically, we will pursue programmatic conservation agreements for restorations and programmatic consultations with state highway departments to minimize and mitigate impacts from bridge/culvert construction and maintenance activities. We will evaluate existing regulatory projects to minimize and mitigate the loss and degradation of trispot darter habitat resulting from urbanization, agricultural practices, and changes to the natural flow regime. We will encourage development of state laws/regulations that are protective of the species and its habitat. We will use existing Clean Water Act regulatory mechanisms (Sections 401 and 404). We will engage county officials and planners in voluntary conservation efforts for the species, and work with all partners to continue to assess habitat and existing threats to determine recovery possibilities. We will also support community based watershed stewardship planning and action, as well as land trust property acquisition and protection to benefit the species.

Recovery actions for the trispot darter will focus on surveying and monitoring existing populations and bolstering low condition populations (as defined and described in Chapter 4 Current Management Unit Condition and Species Viability in the Species Status Assessment Report (USFWS 2018)) through habitat restoration and land stewardship education. Recovery actions (not in priority order) include:

At this time, the following activities have been identified as top priorities:

- Conduct field surveys using conventional methods, develop standardized environmental DNA techniques to determine the species' range, identify additional spawning areas, and identify habitat characteristics of both breeding and non-breeding habitat.
- Conduct status surveys in the historical range (Cowans Creek System, Johns Creek System, and Woodward Creek System) and surrounding areas.
- Maintain connectivity and instream integrity by removal of existing stream barriers and dams, when practical, that block migration and alter the natural hydrology, and replace with structures that enhance migration and restore natural flows.

Other important activities include:

- Develop educational and outreach programs for foresters and County, State, and Federal transportation groups on the use of stream crossings that encourage fish passage and maintain natural hydrology to reduce impacts to ephemeral streams and lowland areas that are crucial spawning areas.
- Conduct additional range wide genetic research, particularly in Ballplay Creek, and apply the results toward genetic diversity enhancement, management, and recovery actions for the species.
- Reduce the input of nutrients, sediment, and other forms of pollution from both point and nonpoint sources by implementing practices such as livestock exclusion fencing, and

maintaining adequate riparian streamside management zones and buffers to reduce runoff, erosion, and help improve overall water quality.

- Investigate the potential use of captive-reared or translocated trispot darters to augment the Ballplay Creek MU and re-populate other historically occupied areas.

IV. PREPLANNING PROCESS

A. PLANNING APPROACH

A Species Status Assessment has been prepared for the trispot darter. We will prepare a recovery plan for the trispot darter using the detailed science in the SSA. Overall, an SSA uses the conservation biology principles of resiliency, redundancy, and representation (collectively known as the “3Rs”) as a lens to evaluate the current and future condition of the species. As a result, the SSA characterizes a species’ ability to sustain populations in the wild over time based on the best scientific understanding of historical, current, and future abundance and distribution within the species’ ecological settings. An SSA is in essence a biological risk assessment to aid decision makers who must use the best available scientific information to make policy decisions. Using the detailed science from the SSA, the recovery plan will include objective and measurable criteria which when met, will ensure the conservation of the species. Recovery criteria will address all meaningful threats to the species, as well as estimate the time and the cost to achieve recovery. The Alabama Ecological Services Field Office will lead the recovery planning effort, with review by the Georgia and Tennessee Ecological Services Field Offices. The draft plan should be finalized and sent to the Regional Office for review by December 2019. The final recovery plan should be finalized and sent to the Regional Office for review by June 2020. These timelines may change as affected by available resources and regional priorities.

B. STAKEHOLDER INVOLVEMENT

During the recovery planning process, input, comments and review will be sought from multiple stakeholders within Alabama, Georgia, and Tennessee. These will include State and Federal agencies, industrial, agricultural, and forestry groups, research universities, and conservation organizations. Many stakeholders are currently cooperating in ongoing conservation planning within the Coosa River Basin.

Approve: _____

Assistant Regional Director, Region 4

Date: 1/30/2019